

IN THE CLAIMS:

Please amend claims 23 and 44-49 and add claims 50-56 as follows:

Claims 1-22 (Canceled)

23. (Currently Amended) A multi frequency carrier transmitter comprising:
input means for receiving a plurality of different digital signals to be transmitted,
said different digital signals to be transmitted on different carrier frequencies;
digital modulators for modulating said different digital signal at ~~the~~ respective
modulation frequencies;
digital to analog converter means for converting a composite digital signal
comprising said different digital signals at the respective carrier frequencies to analog
form, thereby generating a composite analog signal;
amplifier means for receiving and amplifying said composite analog signal; and
predistortion means for predistorting said plurality of different digital signals
during or after modulation of said different digital signals by said digital modulators and
prior to amplification of the composite analog signal by said amplifier means, said
predistortion provided by said predistortion means being subsequently altered in
dependence on differences between each of said different digital signals and the output at
said amplifier means.

24. (Previously Presented) A transmitter as claimed in claims 23, wherein said input means are arranged to separately receive each of said plurality of different digital signals.

25. (Previously Presented) A transmitter as claimed in claim 23, wherein combiner means are provided between the input means and the amplifier means for combining said plurality of different digital signals to provided the composite digital signal.

26. (Previously Presented) A transmitter as claimed in claim 23, wherein the predistortion means are arranged to predistort individually of the plurality of different digital signals.

27. (Previously Presented) A transmitter as claimed in claim 26, wherein said predistortion means predistorts said signals before the plurality of different digital signals before combining by said combiner means.

28. (Previously Presented) A transmitter as claimed in claim 25, wherein the predistortion means is arranged to predistort the composite digital signal after the plurality of different digital signals have been combined by the combiner means.

29. (Previously Presented) A transmitter as claimed in claim 23, comprising a feed back path arranged between the amplifying means and the predistorting means.

30. (Previously Presented) A transmitter as claimed in claim 29, wherein the predistorting means is arranged to compare an output from the amplifying means from the feedback path with the plurality of different digital signals received by the input means and to provide, if necessary, at least one new predistortion value to be applied to at least one subsequent signal received by said input means.

31. (Previously Presented) A transmitter as claimed in claim 29, wherein means are provided in said feedback path for separating an output of the amplifying means into the plurality of different digital signals.

32. (Previously Presented) A transmitter as claimed in claim 31, wherein the predistorting means is arranged to compare each of said separated signals with a corresponding signal received by said input means and to determine if at least one predistortion value needs to be altered.

33. (Previously Presented) A transmitter as claimed in claim 29, wherein said predistorting means is arranged to compare the composite analog signal from the amplifying means with the plurality of different digital signals to provide, if necessary, at least one new predistortion value.

34. (Previously Presented) A transmitter as claimed in claim 23, wherein said predistortion means are arranged to provide a plurality of predistortion coefficients, at least one predistortion coefficient being provided for each multicarrier frequency.

35. (Previously Presented) A transmitter as claimed in claim 34, wherein said predistortion coefficients for each multicarrier frequency takes into account characteristics of other multicarrier frequencies.

36. (Previously Presented) A transmitter as claimed in claim 35, wherein said characteristics comprise one or more of the following:

frequency; and distortion.

37. (Previously Presented) A transmitter as claimed in claim 23, wherein the amplifier means comprises a nonlinear amplifier.

38. (Previously Presented) A transmitter as claimed in claim 37, wherein said predistortion means is arranged to compensate for a nonlinearity of phase and/or amplitude of the amplifier.

39. (Canceled)

40. (Previously Presented) A transmitter as claimed in claim 30, wherein analogue to digital converter means are provided for converting the output from the

feedback path to digital format prior to the output of the feedback path being input to said predistorting means.

41. (Previously Presented) A transmitter as claimed in claim 31, wherein analogue to digital converter means are provided for converting the output of the feedback path to digital format prior to the separating means separating the output of the feedback path into the plurality of different digital signals.

42. (Previously Presented) A base station comprising a transmitter as claimed in claim 23.

43. (Previously Presented) A mobile station comprising a transmitter as claimed in claim 23.

44. (Currently Amended) A multi carrier frequency transmission method comprising the steps of:

receiving a plurality of different digital signals to be transmitted, said different signals to be transmitted on different carrier frequencies;

modulating said different digital signals at the respective modulation frequencies;

combining said plurality of different digital signals to provide a composite digital signal comprising the different digital signals at the respective carrier frequencies;

converting said composite digital signal to analog form, thereby generating a composite analog signal; and

amplifying said composite analog signal, wherein the method further comprises the steps of:

predistorting the plurality of different digital signals prior to amplification of the composite analog signal by the amplification means during or after the modulation step; and

altering the predistortion applied to subsequent digital signals in dependence on the difference between each of said different digital signals and the amplified signal.

45. (Currently Amended) A multi frequency carrier transmitter comprising:

input means for receiving a plurality of different digital signals to be transmitted, said different digital signals to be transmitted on different carrier frequencies;

digital modulators for modulating said different digital signals at ~~the~~ respective modulation frequencies;

combining means for receiving the different digital signals modulated at the respective frequencies to generate a composite digital signal;

digital to analog converter means for converting the composite digital signal to analog form, generating a composite analog signal;

amplifier means for receiving said composite analog signal and amplifying said composite analog signal; and

predistortion means for predistorting said plurality of digital signals during or after modulation of said different digital signals by said digital modulators and prior to

combination of said different digital signals by said combining means, said predistortion provided by said predistortion means being subsequently altered in dependence on a difference between said input different digital signals and an output at said amplifier means.

46. (Currently Amended) A multi frequency carrier transmitter comprising:

input means for receiving a plurality of different digital signals to be transmitted, said different digital signals to be transmitted on different carrier frequencies;

digital modulators for modulating said different digital signals at ~~the~~ respective modulation frequencies;

digital to analog converter means for converting a composite digital signal comprising said different digital signals at the respective carrier frequencies to analog form, generating a composite analog signal;

amplifier means for receiving and amplifying said composite analog signal;

predistortion means for predistorting said plurality of digital signals during or after modulation of said different digital signals by said digital modulators and prior to amplification of the composite digital signal by said amplifier means, said predistortion provided by a said predistortion means being subsequently altered in dependence on a difference between each of said different digital signals and a plurality of different digital sample signals;

analog to digital conversion means for converting a sample of the output of the amplifier means into digital form to generate a composite digital sample signal; and channelizing means for converting said composite digital sample signal into the plurality of different digital sample signals.

47. (Currently Amended) A multi frequency carrier transmitter comprising:

an input for receiving a plurality of different digital signals to be transmitted, said different digital signals to be transmitted on different carrier frequencies;

a plurality of digital modulators for modulating said different digital signal at the respective modulation frequencies;

a digital to analog converter for converting a composite digital signal comprising said different digital signals at the respective carrier frequencies to analog form, generating a composite analog signal;

an amplifier for receiving and amplifying said composite analog signal; and

a predistorter for predistorting said plurality of different digital signals during or after modulation of said different digital signals by said digital modulators and prior to amplification of the composite digital signal by said amplifier, said predistortion provided by said predistorter being subsequently altered in dependence on a difference between each of said different digital signals and the output at said amplifier.

48. (Currently Amended) A multi frequency carrier transmitter comprising:

an input for receiving a plurality of different digital signals to be transmitted, said different digital signals to be transmitted on different carrier frequencies;

a plurality of digital modulators for modulating said different digital signals at the respective modulation frequencies;

a combiner for receiving the different digital signals modulated at the respective frequencies to generate a composite digital signal;

a digital to analog converter for converting the composite digital signal to analog form, generating a composite analog signal;

an amplifier for receiving said composite analog signal and amplifying said composite analog signal; and

a predistorter for predistorting said plurality of different digital signals during or after modulation of said different signals by said digital modulators and prior to combination of said different digital signals by said combiner, said predistortion provided by said predistorter being subsequently altered in dependence on a difference between each of said different digital signals and an output at said amplifier.

49. (Currently Amended) A multi frequency carrier transmitter comprising:

an input for receiving a plurality of different digital signals to be transmitted, said different digital signals to be transmitted on different carrier frequencies;

a plurality of digital modulators for modulating said different digital signals at the respective modulation frequencies;

a digital to analog converter for converting a composite digital signal comprising said different digital signals at the respective carrier frequencies to analog form, generating a composite analog signal;

an amplifier for receiving and amplifying said composite analog signal;

a predistorter for predistorting said plurality of different digital signals during or after modulation of said different digital signals by said digital modulators and prior to amplification of the composite digital signal by said amplifier, said predistortion provided by a said predistorter being subsequently altered in dependence on a difference between each of said different digital signals and a plurality of different digital sample signals;

an analog to digital converter for converting a sample of the output of the amplifier into digital form to generate a composite digital sample signal; and

a channelizer for converting said composite digital sample signal into the plurality of different digital sample signals.

50. (New) A multi frequency carrier transmitter comprising:

input means for receiving a plurality of different digital signals to be transmitted, said different digital signals to be transmitted on different carrier frequencies;

digital modulators for modulating said different digital signal at respective modulation frequencies, said modulation frequencies being an intermediate frequency;

digital to analog converter means for converting a composite digital signal comprising said different digital signals at the respective carrier frequencies to analog form, thereby generating a composite analog signal;

amplifier means for receiving and amplifying said composite analog signal; and predistortion means for predistorting said plurality of different digital signals during or after modulation of said different digital signals by said digital modulators at said intermediate frequency and prior to amplification of the composite analog signal by said amplifier means, said predistortion provided by said predistortion means being subsequently altered in dependence on differences between each of said different digital signals and the output at said amplifier means.

51. (New) A multi carrier frequency transmission method comprising the steps of: receiving a plurality of different digital signals to be transmitted, said different signals to be transmitted on different carrier frequencies; modulating said different digital signals at respective modulation frequencies, said modulation frequencies being an intermediate frequency; combining said plurality of different digital signals to provide a composite digital signal comprising the different digital signals at the respective carrier frequencies; converting said composite digital signal to analog form, thereby generating a composite analog signal; and

amplifying said composite analog signal, wherein the method further comprises the steps of:

predistorting the plurality of different digital signals prior to amplification of the composite analog signal by the amplification means during or after the modulation of said different digital signals by the modulating means at said intermediate frequency; and

altering the predistortion applied to subsequent digital signals in dependence on the difference between each of said different digital signals and the amplified signal.

52. (New) A multi frequency carrier transmitter comprising:

input means for receiving a plurality of different digital signals to be transmitted, said different digital signals to be transmitted on different carrier frequencies;

digital modulators for modulating said different digital signals at respective modulation frequencies, said modulation frequencies being an intermediate frequency;

combining means for receiving the different digital signals modulated at the respective frequencies to generate a composite digital signal;

digital to analog converter means for converting the composite digital signal to analog form, generating a composite analog signal;

amplifier means for receiving said composite analog signal and amplifying said composite analog signal; and

predistortion means for predistorting said plurality of digital signals during or after modulation of said different digital signals by said digital modulators at said intermediate

frequency and prior to combination of said different digital signals by said combining means, said predistortion provided by said predistortion means being subsequently altered in dependence on a difference between said input different digital signals and an output at said amplifier means.

53. (New) A multi frequency carrier transmitter comprising:

input means for receiving a plurality of different digital signals to be transmitted, said different digital signals to be transmitted on different carrier frequencies;

digital modulators for modulating said different digital signals at respective modulation frequencies, said modulation frequencies being an intermediate frequency;

digital to analog converter means for converting a composite digital signal comprising said different digital signals at the respective carrier frequencies to analog form, generating a composite analog signal;

amplifier means for receiving and amplifying said composite analog signal;

predistortion means for predistorting said plurality of digital signals during or after modulation of said different digital signals by said digital modulators at said intermediate frequency and prior to amplification of the composite digital signal by said amplifier means, said predistortion provided by a said predistortion means being subsequently altered in dependence on a difference between each of said different digital signals and a plurality of different digital sample signals;

analog to digital conversion means for converting a sample of the output of the amplifier means into digital form to generate a composite digital sample signal; and channelizing means for converting said composite digital sample signal into the plurality of different digital sample signals.

54. (New) A multi frequency carrier transmitter comprising:

- an input for receiving a plurality of different digital signals to be transmitted, said different digital signals to be transmitted on different carrier frequencies;
- a plurality of digital modulators for modulating said different digital signals at respective modulation frequencies, said modulation frequencies being an intermediate frequency;
- a digital to analog converter for converting a composite digital signal comprising said different digital signals at the respective carrier frequencies to analog form, generating a composite analog signal;
- an amplifier for receiving and amplifying said composite analog signal; and
- a predistorter for predistorting said plurality of different digital signals during or after modulation of said different digital signals by said digital modulators at said intermediate frequency and prior to amplification of the composite digital signal by said amplifier, said predistortion provided by said predistorter being subsequently altered in dependence on a difference between each of said different digital signals and the output at said amplifier.

55. (New) A multi frequency carrier transmitter comprising:

an input for receiving a plurality of different digital signals to be transmitted, said different digital signals to be transmitted on different carrier frequencies;

a plurality of digital modulators for modulating said different digital signals at respective modulation frequencies, said modulation frequencies being an intermediate frequency;

a combiner for receiving the different digital signals modulated at the respective frequencies to generate a composite digital signal;

a digital to analog converter for converting the composite digital signal to analog form, generating a composite analog signal;

an amplifier for receiving said composite analog signal and amplifying said composite analog signal; and

a predistorter for predistorting said plurality of different digital signals during or after modulation of said different signals by said digital modulators at said intermediate frequency and prior to combination of said different digital signals by said combiner, said predistortion provided by said predistorter being subsequently altered in dependence on a difference between each of said different digital signals and an output at said amplifier.

56. (New) A multi frequency carrier transmitter comprising:

an input for receiving a plurality of different digital signals to be transmitted, said different digital signals to be transmitted on different carrier frequencies;

a plurality of digital modulators for modulating said different digital signals at respective modulation frequencies, said modulation frequencies being an intermediate frequency;

a digital to analog converter for converting a composite digital signal comprising said different digital signals at the respective carrier frequencies to analog form, generating a composite analog signal;

an amplifier for receiving and amplifying said composite analog signal;

a predistorter for predistorting said plurality of different digital signals during or after modulation of said different digital signals by said digital modulators at said intermediate frequency and prior to amplification of the composite digital signal by said amplifier, said predistortion provided by a said predistorter being subsequently altered in dependence on a difference between each of said different digital signals and a plurality of different digital sample signals;

an analog to digital converter for converting a sample of the output of the amplifier into digital form to generate a composite digital sample signal; and

a channelizer for converting said composite digital sample signal into the plurality of different digital sample signals.